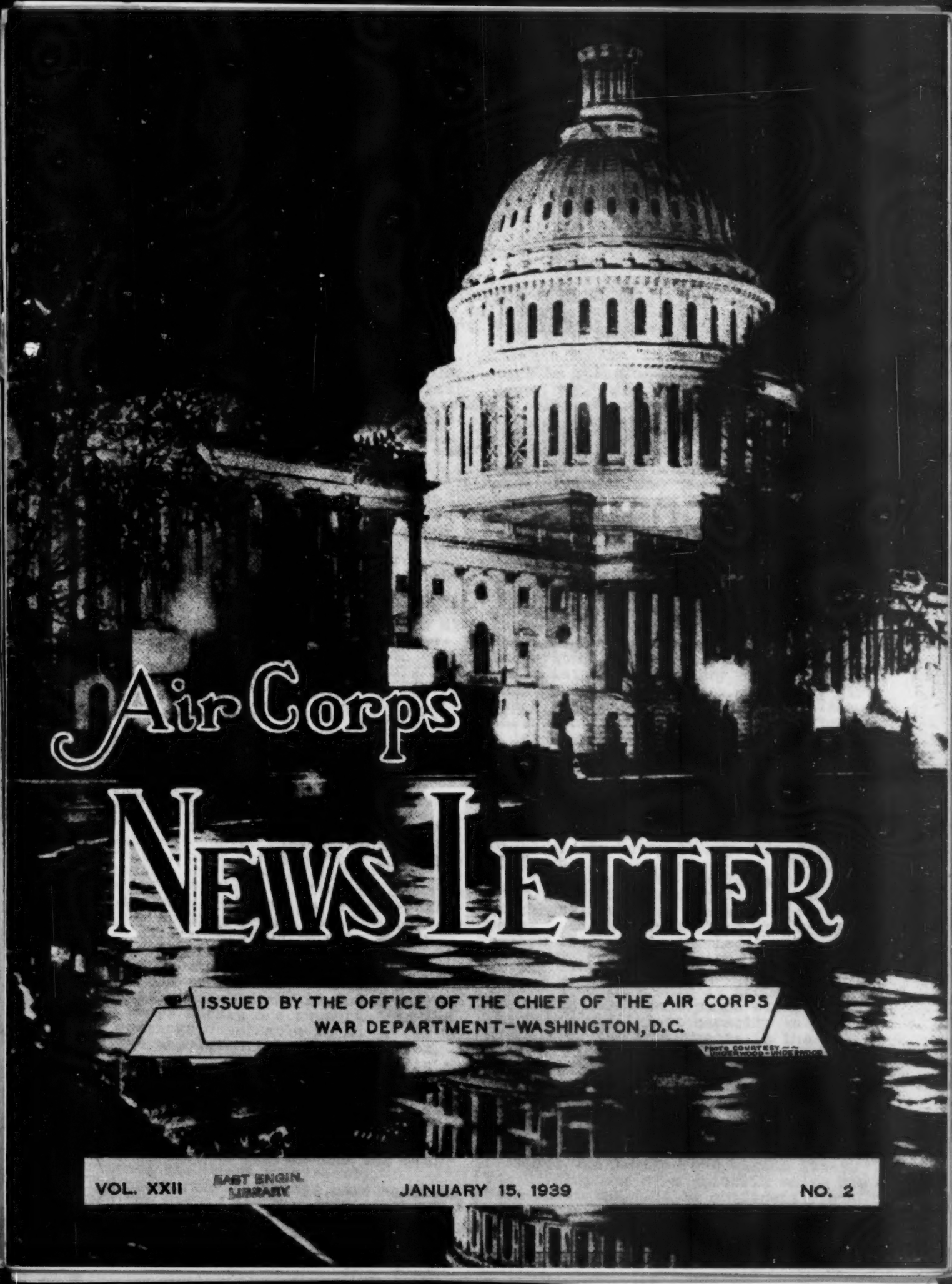

# Air Corps NEWS LETTER

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VOL. XXII AIR CORPS NEWS LETTER NO. 2

Information Division
Air Corps

January 15, 1939

Munitions Building
Washington, D.C.

The chief purpose of this publication is to distribute information on aeronautics to the flying personnel in the Regular Army, Reserve Corps, National Guard, and others connected with aviation.

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## VACUUM OPERATED AIRCRAFT INSTRUMENTS

By J. P. Callahan
Materiel Division, Wright Field

The words "gyro instruments" have long since become familiar to those interested in aeronautics. Pilots have used them and have learned how to rely upon them in the form of bank and turn indicators, flight indicators, turn indicators, and automatic pilots. However, just what takes place inside of the cases of these instruments is mysterious not only to the lay person but also to many engineers.

The gyroscope is essentially a spinning wheel, the spin taking place at a high rotational speed. The two fundamental principles of gyroscopic action are those of inertia and of precession. The spinning wheel, if supported in a frictionless manner, will retain the direction of its axis in space, independent of the direction of the earth and of its magnetic fields. It is this effect which is made use of in the Sperry automatic pilot, flight indicator and turn indicator. The second principle, that of precession, is made use of in the bank and turn indicator. When a force couple is exerted on a gyroscope in an effort to change the direction of its spinning axis, the gyroscope exerts a force and moves, unless restrained, in a direction at right angles to the applied force couple. The movement is in a direction that tends to put the plane of rotation of the wheel in the same plane as that of the applied force couple, with the wheel turning in the direction that the applied couple would have it turn. In aircraft instruments the gyroscopic element consists of a brass wheel, approximately 2 inches in diameter and one inch thick, rotating at speeds of approximately 12,000 r.p.m. These brass wheels are supported on the best bearings obtainable in an effort to have the absolute minimum of friction. The bearings in turn are supported in a gimbal or ring and this gimbal again is supported in the best bearings obtainable for the same reason. If there is the slightest amount of friction in either the rotor or gimbal bearings, a gyro will tend to precess and the instruments will read incorrectly.

The above considerations have necessitated the use of air for driving the rotors or spinning wheels. If electrical power were used, it would be necessary to carry wires across the gimbal bearings and probably to install commutators or slip rings in the rotor and brushes in the rotor housing. The friction of the brushes and the stiffness of the connecting wires across the bearings have meant that electrically driven gyroscopes in the past have been used without difficulty only in bank and turn indicators. If air under pressure were used, it would be necessary to remove every bit of oil introduced in the air by the pump, as well as to include safety features in order to reduce the dangers of high pressure which might result from a stoppage in the system. Therefore, buckets have bee built into the periphery of the rotors and the rotors have been driven by air under vacuum which is pulled into the instrument through an orifice producing a jet of air which impinges on the buckets.

In the bank and turn indicator operating under a vacuum of two inches of mercury within the instrument case the velocity of the air in the jet is approximately 300 m.p.h. The peripheral speed of the rotor is approximately 60 m.p.h.

A large amount of development in vacuum systems for operating these instruments has taken place in recent years. In the first place the vacuum system is so designed that in case of engine or pump failure the instruments will continue to operate. In multi-engine airplanes this is accomplished by having two vacuum pumps either of which has sufficient capacity to operate all of the instruments in the airplane. A manually controlled three-way vacuum selector valve is installed in such a way that the pilot may select either or both vacuum pumps to operate the instruments. At the present time there is no check valve which has a sufficiently low pressure drop to warrant its use in aircraft vacuum lines. The development of a suitable valve has been initiated. It is confidently expected one will be available in the near

future. With two such valves, one installed in the line to each pump, the pilot could set his selector valve to connect both pumps to the instruments. Then in case of the failure of one pump or of one engine, the check valve would automatically cut it out of the circuit and the instruments would operate without interruption.

In the case of the single engine airplane, the venturi tube has been used to furnish the alternate source of vacuum. However, one type B-4 venturi tube will decrease the high speed of an airplane equipped with a 1000-h.p. engine by 1¼ m.p.h. at 200 m.p.h. and 6½ m.p.h. at 300 m.p.h. As higher speeds are being attained, it is obvious that the type B-4 power venturi tube is too inefficient to be used. It should also be remembered that in order to enable a flight and a turn indicator to operate in an emergency glide of approximately 100 m.p.h., two such venturi tubes are necessary. Aircraft manufacturers are now working on retractable venturi tube installations so arranged that as the pilot selects his alternate source of vacuum, the venturi tubes will be thrust into the air stream.

The Air Corps specification for the installation of vacuum operated instruments requires that in single engine airplanes an alternate source of vacuum be provided for the bank and turn indicators only, on the assumption that the bank and turn indicator is the only essential gyroscopic instrument from the viewpoint of safety in descending through an overcast. The alternate source provided should be either a small type A-3 venturi tube or the suction provided by the engine intake manifold. The latter is at a disadvantage in that it is not available in case of engine failure. The type A-3 venturi tube has a drag of .50 pound at 100 m.p.h. as compared with 2.0 pounds at the same speed for the type B-4 venturi tube. This in turn means that the decrease in high speed of an airplane powered with a 1000 h.p. engine at 300 m.p.h. is only 1.8 m.p.h.

The use of the alternate source is manually controlled by the pilot by means of a four-way valve. The bank and turn indicator is connected either to the pump as in normal operation or to the venturi tube or engine intake manifold.

The Air Corps is now using one vacuum pressure regulator which serves the double purpose of regulating the vacuum pressure in the instruments and of relieving the pump when the line to the instruments is closed. It relieves and regulates. This regulator is installed not more than approximately 2 feet away from the pump and is adjusted to maintain a vacuum pressure of 4.00 .25 inches Hg. in the case of the flight indicator for all engine speeds between 1000 r.p.m. and the maximum rated engine speed.

It is essential that a suction gauge be used with each installation of vacuum operated instruments. The pilot has no other way of knowing when the instruments may be relied upon.

The greatest difficulty encountered in the operation of gyroscopic instruments is that of bearing failure. Moisture and dust pulled into the instrument from the surroundin, air cause corrosion and pitting of the bearings. Filters are now standard equipment on all instruments, but they keep out the dust only.

The Materiel Division is now working on a means of eliminating moisture as well as dust from the system. This development is being looked forward to by aircraft instrument engineers with eagerness, as it promises to increase the reliability and life of gyroscopic instruments.

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## ACTIVITIES OF THE FIRST PURSUIT GROUP

"It has been noted," says the Selfridge Field Correspondent, "that several Air Corps officers are claiming flying time in excess of 5,000 hours. Selfridge Field has the distinction of having one such officer, Major William R. Sweeley, Air Corps, who has 5160 hours pilot time. In addition, he has several hundred hours' Observer time."

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The Cold Weather Equipment Test, which started at Selfridge Field on January 2nd, was called off because of warm weather, and there was every indication that there would be no cold weather in the immediate future. However, on January 12th, three hours after all visiting units had returned to their home stations after the suspension of this test, it commenced snowing, and this continued throughout the day, turning colder that evening.

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During the absence of Major Harold R. Wells, Air Corps, Commanding Officer of Headquarters Squadron, 1st Pursuit Group, Captain James E. Briggs, Air Corps, has taken over the Squadron Commander's duties.

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Two second lieutenants of the Air Reserve, James O. Beckwith and William C. Armstrong, were assigned to the 17th Pursuit Squadron as of January 12, 1939, upon the completion of student training at Randolph and Kelly Fields. Lieut. Beckwith hails from Burlington, Vt., and Lieut. Armstrong from Cleveland, Ohio.

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Sergeant King and Private, 1st Class, Koch, of Headquarters Squadron, signed on the dotted line for another three years. "Could they be thirty-year men?" the News Letter Correspondent inquires.

## SOME DETAILS ON OFFICER IN WHOSE MEMORY LOWRY FIELD WAS NAMED.

An Air Corps officer who saw Francis B. Lowry, Denver World War flyer, shot down and killed on September 26, 1918, recently paid a visit to the field which was named in honor of the Lieutenant.

He was Lieut. Colonel Asa N. Duncan, Executive Officer of March Field, Calif., one of seven surviving members of Lieut. Lowry's squadron still in the Regular Army.

"Lieut. Lowry was one of the crack flyers of the 91st Observation Squadron," Col. Duncan said. "I never became intimately acquainted with him because he was killed only a few days after I joined the squadron, but I remember well his being shot down.

"A group of five planes had been sent up to photograph bridges near Verdun. This was on the day the Argonne drive was started.

"We were flying French observation type planes. My companion and I were at the tail end of the formation on the left. Lowry and a chap with him by the name of Kelty were in the same position in the group, only on the right."

Col. Duncan said an anti-aircraft shell struck Lowry's ship, splitting it in two. It fell apart in the air and crashed. The planes in the group had been flying at high altitude.

The Ninety-first Observation was one of the worst sufferers of casualties, Col. Duncan said. Its flights were all made over the front line trenches. German guns were constantly trained on this group because of the crack flyers that composed it.

"An example of the way we were hit by casualties," Col. Duncan declared, "was my own case. When I joined the Squadron I was the youngest man in it. Thirty days later I was the oldest."

It was no secret, he said, that Lowry was one of the crack airmen in Uncle Sam's forces, adding that that was not only his opinion but "the old-timers declared he was one of the best."

"It is certainly a fitting tribute," Col. Duncan declared, "that the field located at the Air Corps Technical School should be named after him as a lasting tribute. The Air School here appears to be destined to become one of the Army's great aviation centers."

While at Lowry Field, Col. Duncan was the guest of Col. Jacob H. Rudolph, Lowry Field Commandant. Col. Duncan was taken on an extensive tour of the field and manifested great interest in the work being done. Col. Rudolph remarked that he was planning to have painted at the School a huge picture of Lieut. Lowry and was negotiating with officials in Washington with the view to securing the necessary permission to allow this painting to be made.

## ACTIVITIES AT MARCH FIELD, CALIF.

Lieut. Colonels Benjamin G. Weir, Warner B. Gates, Majors Eugene L. Eubank, Walter R. Peck, Emil J. Kiel and Lucas V. Beau, Jr., left March Field for the Air Corps Tactical School at Maxwell Field, Ala., to pursue a thirty-day course in Naval Tactics, beginning January 9th.

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Lieut. Charles M. Fischer, Air Reserve, recently announced plans to start production of a new safety airplane for private flyers. The factory will be located in Glendale, Calif. The airplane will be known as the Fischer Air Coupe.

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The old blunt-nosed B-18's are rapidly being replaced on the 19th Bombardment Group's line with the "shark nose" B-18A's.

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Brigadier General Barton K. Yount, Commanding General of the Air Corps Training Center, arrived at March Field on January 4th in a B-18 for a short visit.

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On Thursday, December 29th, March Field was honored in a fifteen-minute "salute to a National Institution" over the Columbia Broadcasting System.

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The new 350-men barracks, nearing completion at March Field, will house the 19th Bombardment Group and greatly reduce the crowded condition at March Field.

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## DROUGHT BROKEN IN SOUTH TEXAS

South Texas, suffering from a seven months' dry spell, finally got a respite when rain, which started falling on December 22nd, lasted through Christmas Day. Although the local dust problem has been alleviated, temporarily at least, a generalized dust storm swept down on the Primary Flying School at Randolph Field, and all of South Texas on January 5th.

Despite a cloudless sky, visibility was reduced to one-half a mile during most of the day, the local weather station reported, and for the first time this winter flying was cancelled because of dust. Previous to the Christmas holidays, the outlying airdromes used for practice work both on Primary and Basic Stages were very dusty due to the lack of rain, but after weathering this unpleasant situation, the flying personnel were forced to curtail instruction when the generalized dust storm swept down from the northwest.

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## GLOSSARY OF FLYING CADET TERMINOLOGY
Continued from previous issue

The News Letter Correspondent from Randolph Field, Texas, presents herewith the second installment of Flying Cadet phrases, expressions, etc., which have either been originated in the Cadet Detachment at Randolph Field, or have been given special meanings by that organization. Their publication is for the general information of the Air Corps at large, that they may be acquainted with the phrases as they crop up from time to time.

Contribution of phrases which are popular at various Air Corps stations are requested by the Public Relations Officer of Randolph Field, so that eventually it may be possible to publish a complete glossary of Air Corps Terminology.

Storm -- Name applied to the condition one is in when he is excited and doesn't know what he is doing.

Dawn Patrolling -- One is said to be dawn patrolling when he arises before reveille. Also noun, the Dawn Patrol; also adjective - a Dawn Patroller.

Dodo Tom -- The janitor of B Company, whose service dates back to 1922 at Brooks Field. For the information of former Flying Cadets, Dodo Tom is now on Civil Service status, but still has never been in an airplane.

Dodo -- The name given to a lower classman, which he retains until he is promoted to Basic Stage.

Gun -- Verb..To ask a waiter in the Mess Hall for a second filling of a dish. For example - "Gun the potatoes," meaning, have the potato dish replenished.

Gunner -- One of the lowerclassmen who sit at the end of the tables in the Mess Hall and is charged with keeping all dishes replenished.

H.P. -- Abbreviation for Hot Pilot... one who is exceptionally good.

Gig -- The popular name for a demerit.

Tour -- An hour of marching on the ramp with rifle and white gloves. Given as a penalty.

"6 and 20 Tootsie" -- Any bit of young enticing femininity who is responsible for a Cadet returning late from a week end leave - "6 and 20" meaning six demerits and 20 tours.

Power Birds of War -- Another name for all Flying Cadets.

City of Wings -- Derisive term for Randolph Field, used usually during rest periods of Infantry drill.

Riding the beam -- Gazing at the ceiling after violating a custom in the Mess Hall.

Bunk Flying -- Talking aviation while in the barracks.

"Drive it in the hangar." --"Let's stop bunk flying."

Cadet Widow -- A young lady who has known Flying Cadets for several classes.

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## RANDOLPH FIELD SETS FLYING RECORD FOR WINTER MONTH.

Amassing a total of 15,994:30 hours of flying time during the month of December, the Primary Flying School at Randolph Field set a record for time during a winter month. When it is remembered that student training was cancelled on December 22nd for the Christmas holidays, the total number of hours presents an even more imposing appearance.

Only twice in the history of Randolph Field has this figure of almost 16,000 hours in a single month been surpassed. Last August, more than 16,500 hours were flown, and during September the all time high of 17,373 hours were flown. At the time, it was computed that Randolph Field airplanes flew a distance of more than three times around the world at the equator every one of the thirty days of that month.

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## SOLDIER'S MEDAL PRESENTED TO RANDOLPH FIELD SERGEANT

To the strains of martial music, Sergeant Harry M. Hayes, of the 47th School Squadron, Randolph Field, Texas, was presented with the Soldier's Medal at a review on January 7th. Brigadier General Barton K. Yount Commanding General of the Air Corps Training Center, presented the medal.

The entire command of Randolph Field was present to pay homage to Sergeant Hayes, who on July 2, 1938, rescued the pilot and two companions from a B-10 airplane which crashed into the sea near Mariata Point, Mala Peninsula, Republic of Panama. The pilot, Lieut. K.B. Hobson, was dazed from the crash and was in danger of drowning, when Sergeant Hays extricated him from the pilot's cockpit, dragged him to the wing of the overturned plane, and applied artificial respiration. Sergeant Hays then inflated the collapsible life raft and got the three men to the shore.

Sergeant Hays figured in the news on two occasions previous to his heroic rescue in Panama. He made an emergency parachute jump from a disabled airplane near Dryden, Texas, and ten years later made his second emergency leap, this time from a Bombardment airplane.

Sergeant Hays entered the service in 1926 at Kelly Field, Texas, and most of his service has been at the Training Center and in the Canal Zone.

V-7946, A.C.

## PERFORMANCE AND DEVELOPMENT TRENDS IN MILITARY AIRCRAFT AND ACCESSORIES

In an address before the Society of Automotive Engineers at Detroit, Mich., on January 11, 1939, Major General Henry H. Arnold, Chief of the Air Corps, discussing some recent trends in the fighting airplane and accessory development, stated that there is an insistent demand for incredible speeds in our late fighting planes. "It appears," he stated, "that no plane can be considered for future development which will not have a speed in excess of 400 m.p.h., and our engineers are talking quite seriously of 500 m.p.h. as a practical possibility. They propose to reach these speeds possibly in two ways. First, in what is called a 'clean up of design,' as the engineers say, they are going to bring everything indoors and lock the door; nothing will be left projecting or hanging outside. The other method is by a tremendous increase in the horsepower of the motive power plant. There are other accessories and adjuncts which will play vital parts, such as propellers and fuels. The definite trend for the fighter is for a smaller and lighter airplane. It will be small and as light as possible, bearing in mind that it must house a power plant of some 2-4,000 h.p., and there must be a gun platform, probably for a single small cannon of at least 37 mm. caliber. It will have but a single occupant, as the pilot will also serve the gun which will be electrically operated and controlled. There is but one slight variation from this mighty little atom of a fighter which I have just described and that may be the advent of the multi-seater fighter. There has been considerable feeling of late that the modern air war is going to require a plane of the fighter type which can carry more armament, perhaps two cannon and from two to four machine guns of 30-50 caliber, in order that it may engage in combat with the Flying Fortress on more equal terms.

"In this country we jumped to an early lead in this category when our engineers with the cooperation of the Bell Aircraft Company of Buffalo, produced the XFM-1, a multi-seater fighter with which we experimented last year and which has now been ordered in a service quantity of 13. Perhaps no airplane produced last year called forth such widespread comment both at home and abroad as this so-called 'Aircuda.' A British magazine said of it - 'The U.S. Army Air Corps' new Bell Fighter is the coming thing. The technical department of every air force in the world would give a lot to have 48 hours alone with this machine.' This oversized fighter version will have one other added advantage - it will have a range which will permit it to accompany and defend our own bombardment formations on long air raids.

"Bombardment aviation is the basic subdivision of the flying arm just as the infantry is the basic ground arm. Upon bomber success will depend the eventual outcome of the air struggle. This knowledge has led us to concentrate on perfection of this type. Military strategists of every nation agree that the modern bomber must have the range to reach any vital target in the enemy nation; it must have the speed to reach that objective in the quickest possible time for efficiency in the performance of its mission and as an aid to escape from hostile pursuit; it must carry a sufficient quantity of explosives to make its errand an economical one and to give it the capacity to destroy any objective.

"These superior requirements have led us to experiment with substratosphere and over-weather flying. During the past year we have had very actively in operation our own substratosphere plane, the XC-35, which has served as a high altitude laboratory. Our success with it indicates the early probability that giant bombers will house their personnel in sealed pressure cabins and that they will be designed and equipped to fly in altitudes in excess of 30,000 feet.

"Last September the President of the United States presented to me as Chief of the Air Corps the Collier Trophy, emblematic of the outstanding aeronautical development of the year, for the work our Corps did in developing and testing the substratosphere plane, the first pressure cabin plane ever successfully flown extensively anywhere in the world. This is a fair indication of the import of high altitude flying, both for military and commercial planes. It would not be surprising, therefore, if a considerable proportion of future air traffic will be beyond the sight and sound of terrestrial inhabitants. Necessity and economy will demand this innovation.

"The great increase in size and speed of air vessels has led to tremendous changes in the dimensions and types of airdromes. There is now a general feeling that we must concentrate on a reduction in airdrome requirements by building into our planes slower landing speeds. I believe that this research will continue with all variety of flaps and slots in an effort to obtain better control and to reduce landing speeds.

"It is possible that during the next five years the airplane may take on an appearance considerably different, at least superficially, from its present form. Basically, the wing-body com-

(Continued on Page 15).

## DEATH OF PROMISING YOUNG PILOT

While piloting an A-17 airplane shortly past noon on January 8th, 2nd Lieut. Wallace Embry Nau, Air Corps, was killed instantly when the plane crashed into rimrock some nine miles south of Trichere, Colo., during a snowstorm. The engine was torn from the airplane by the crash. The parachute was not used.

Lieut. Nau was born at Cavalier, N.D., September 16, 1915. He graduated from Marshall, Jr. High School, Pasadena, Calif., in 1931, and from the Pasadena Junior College in 1935. Shortly afterwards he enlisted in the Air Corps and served as a private with the Station Complement at March Field, Riverside, Calif.

Qualifying for appointment as a Flying Cadet, he graduated from the Air Corps Primary Flying School, Randolph Field, Texas, October 10, 1936, and from the Advanced Flying School, Kelly Field, Texas, where he specialized in Attack Aviation, on February 17, 1937. He was given the rating of "Airplane Pilot" and assigned to duty under his flying cadet status with the 95th Attack Squadron at March Field. He received his appointment as a second lieutenant in the Air Reserve on June 20, 1937. About a year later he passed the examination for a commission in the Regular Army, and on July 1, 1938, he was commissioned a second lieutenant in the Air Corps.

On August 26, 1938, Lieut. Nau was transferred to Lowry Field, Colo., for duty as a student at the Denver Branch of the Air Corps Technical School. At the Air Corps Training Center, the deceased young officer proved an apt pupil and he was on the way to a successful career as an Air Corps officer.

The Air Corps extends its deep sympathy to the bereaved relatives of the deceased.

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## WHAT'S IN A NAME?

A telegraphic report on an airplane accident at Randolph Field, Texas, gave the name of the pilot as Flying Cadet F.R. Pancake, a student at the Primary Flying School. The accident, however, was not due to a cause such as the name of the pilot would imply. He was engaged in night flying and struck some flood lights in taking off. The Cadet suffered no injury.

In the Army, as in other walks of life, there occur many instances where the name of an individual is peculiarly coincidental with the nature of the occupation in which he is engaged. For instance, in the permanent commissioned personnel of the Regular Army such names are noted as Code, Patient, Ryder and Bridges. Now it just happens that Major James A. Code, Jr., is in the Signal Corps; Captain William F. Patient is a medical officer; Major H.L. Ryder is a Cavalry officer, and Captain William C.D. Bridges is in the Corps of Engineers. And while touching on these interesting coincidences, what more appropriate name could there be in the Finance Department of the Army than Overcash? Actually an officer by that name has a Reserve commission in that branch of the service.

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## AIR-MINDED CALIFORNIA

The Civil Aeronautics Authority of the United States recently released statistics, as of October 1, 1938, which show that 11 per cent of the 10,091 certified aircraft of the United States is registered in California, and 19.4 per cent of the 21,526 pilots of the nation are also in this State.

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## NOTABLE INCREASES IN AIR TRAFFIC

Western Air Express, Burbank, Calif., flew 665,000 passenger miles during November, 1938, to show an increase of nearly 60 per cent over the same month last year, and thus establishing an all-time November passenger record.

Nearly 2,100 passengers were carried on the Western Air Express' border-to-border system during November, as compared with 1850 who flew Western Air Express during the same month in 1937, a gain of 14 percent for November, 1938.

November's mail load of 75,950 pounds represented an increase of 16 per cent over mail poundage carried during November, 1937.

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## KELLY FIELD SOLDIER RECEIVES COMMENDATION FROM U.S. COAST GUARD.

Private, 1st Class, William M.W. Hewgley, 12th Air Base Squadron, the Air Corps Advanced Flying School, Kelly Field, Texas, was the recipient recently of a letter of commendation from Captain William J. Wheeler, U.S. Coast Guard, Commander, New Orleans Division, expressing appreciation for the assistance rendered following the crash of a Coast Guard airplane at Boerne, Texas, on December 19, 1938. The letter follows:

"It has been reported to the Commander, New Orleans Division, U.S. Coast Guard, that Private first class Bill Hewgley, U.S. Army, attached to the Air Detachment under your command, rendered exceptionally fine assistance and cooperation following the crash of Coast Guard J2W-1 airplane, V-157, at Boerne, Texas, on the evening of December 19, 1938, which resulted in the tragic

(Continued on Page 8.).

## AN "EARLY BIRD" OF PUSHER SHIP ERA.

The dangers that beset aviation's valiant pioneers - stalwart flyers who risked life and limb on every flight - are vivid memories for Clair G. Horton, of San Antonio, an "Early Bird," himself, who cheated death in the thrill-packed era of the pusher type planes.

Today, Horton is rounding out more than 30 years' continuous experience in the aeronautics game. As general foreman of the aircraft shops at Duncan Field, he comes in close contact with the most modern of planes, but he's never piloted any of them.

In fact, he has never flown any plane but those of the old pusher type because his actual flying career extended from June, 1914, to March, 1915. But during that period, and as a mechanic both before and after his pilot days, he saw unfolded, as part of his daily life, the hardships, the drama, the ingenuity and the perils and courage associated with early aviation.

Among his closest associates were such famous pilots as Charles Hamilton, Lincoln Beachey, Glenn H. Curtiss, Eugene Ely, Bud Mars, August Post, James J. Ward and John McCurdy.

Horton's career began in September, 1908, when he obtained employment with the Glenn H. Curtiss Airplane and Motorcycle Co., at Hammondsport, N.Y. There he not only worked on aircraft but assembled motorcycles and tested them on various tracks.

In 1910 he joined the Curtiss Exhibition Company at Baltimore, Md., as aviation mechanician, assembling, maintaining and disassembling exhibition airplanes being flown at various cities throughout the eastern and southern sections of the United States and Cuba.

Horton was in Havana in January, 1911, when J.A.D. McCurdy attempted to fly from Key West to Havana, a distance of 98 miles. McCurdy ran out of oil 10 miles from his destination and dropped into the Gulf of Mexico. He was picked up six minutes later by the United States Navy torpedo boat Paulding, one of five which had been stationed along the route for just such an emergency.

The Curtiss biplane was kept afloat in the shark-infested waters by two safety tanks strapped to the lower surface of the plane,- a happy foresight, for several sharks had collected by the time McCurdy was rescued from the top wing, where he had taken refuge.

Horton recalls that in those days pilots were lacking in number, and it was not unusual for a man to solo himself without any previous flying experience. Such a man was Lincoln Beachey, although it must be said that he previously had been a dirigible pilot for several years.

On his first take-off at Camp Columbia, Havana, Beachey flew into the wind and made a successful hop, but upon his return trip he ran into disaster. When he set the plane down he mashed his front elevators and bamboo outriggers directly into the president of Cuba's French automobile.

Undaunted, Beachey developed into a daredevil and stunt flyer and in the same year, 1911, flew over Niagara Falls. Also in that year, during the Chicago Aviation Meet, he went up to 11,000 feet and won the world's altitude record.

Later, Beachey was drowned while flying at the California Panama Pacific Fair in San Francisco. The wings of his plane folded up when he was coming out of a vertical dive.

"The year before Beachey was killed," Horton said, "I had seen him flying in a 60-mile gale, dive 5,000 feet straight for the earth and, when 300 feet from the ground, push forward on his elevators and throw the pusher plane bottom up and fly with the wind for a quarter of a mile. Then he would pull the elevator back, dive down again until he came right-side-up and come in and land.

"The plane he used in his trick had no horizontal or vertical stabilizer whatever; there was no fuselage to restrict the maneuvers and I doubt if modern planes could maneuver in as close as he did," Horton said.

Horton remembers James J. Ward, while at Cienfuegos, Cuba, flying a plane with a propeller that was patched together with ordinary glue. Every once in a while the propeller would fly apart and each time it would have to be glued together again.

He recalls the coast-to-coast air race which Ward and Calbraith P. Rodgers entered in 1911 for the $50,000 prize money offered to the first man to fly from New York to Los Angeles. After Ward had spent about $20,000 trying for the $50,000 prize, his backers decided to call it a day, and he went back to exhibition flying.

Rodgers finally landed at Pasadena on Nov. 5, after numerous forced landings. The race had started Sept. 17. On Rodgers' last run out to the edge of the Pacific Ocean, some sea gulls became lodged in the chain and sprocket of his elevator controls and he dove into the beach and was killed, Horton said.

Horton, himself, was nearly drowned twice in accidents involving his hydroplane, once in Lake Winnipeg, Canada, when a strap became enmeshed in the plane's mechanism, throwing the craft out of control and into the lake, and again when the plane overturned in storm-lashed Lake Ponchartrain, La.

In the latter accident Horton was under the water more than two and one-

(Continued on Page 8 ).

## THE MUNICIPAL AIRPORT AT MEDFORD, OREGON

For the purpose of acquainting visiting Air Corps personnel with the accommodations and facilities available to transient aircraft visiting the Municipal Airport at Medford, Oregon, the following information is submitted:

Personnel: (Ninth Corps Area Air Corps Detachment):

Staff Sergeant Willie M. Daws - N.C.O., In Charge - Airplane Mechanic.

Sergeant AM 1st Class William T. Wheeler - Airplane Mechanic.

Private AM 2nd Class Joseph V. Mendrala - Airplane Mechanic.

Corporal AM 1st Class Allen P. Cross - Radio Operator In Charge WYQ.

Private AM 2nd Class Pete H. Christiansen - Radio Operator.

Private AM 2nd Class John E. Nagley - Radio Operator.

Private AM 2nd Class Raymond W. Kalbfleisch - Radio Operator.

Accommodations and facilities:

There is always an ample supply of government contract gasoline (92 octane) and oil (120) available. Should more than our normal storage capacity of 2000 gallons of gasoline be required, one or more tank trucks can be sent out from the city in approximately twenty to thirty minutes. Airplanes can be serviced at the rate of about 28 gallons per minute.

Air Corps supplies are very limited but, should the need arise, spare parts can be ordered and delivered by air from the Air Corps Depot in approximately three to four hours.

The municipally-owned hangar has ample storage space, being 100' x 110' inside, and is in excellent condition.

The Air Corps Detachment is equipped with a Chevrolet Reconnaissance Car (8-passenger), which assures ample transportation to and from the city, which is about three and one-half miles from the airport. Additional staff cars and trucks can be secured from the Medford District Headquarters of the CCC, should they be required.

Two mechanics are on duty daily, including Sundays and Holidays, from 8:00 a.m. to 4:30 p.m., and arrangements have been made with the Department of Commerce Radio Operator on duty to call the Airport Superintendent, Mr. T.A. Culbertson, Jr., (2nd Lieut., Air Reserve) and one of the mechanics, should any aircraft arrive after closing hours. The men on duty meet and service all aircraft assigned the Air Corps, the Marine Corps, Navy, National Guard and the U.S. Coast Guard.

There is maintained at the Airport a weather bureau, teletype station, and Department of Commerce radio station in addition to the Army Airways Communication Station. The Department of Commerce radio station (KCX) operates on 263 kcs and stands-by on 3105 kcs. continually. The Army Airways Communications Station (WYQ) operates on 4220 kcs to aircraft and stands-by on 3105 kcs from 7:00 a.m. to 5:00 p.m. daily, including Sundays and Holidays, but as yet has no facilities for receiving weather reports. Pilots approaching should call the Department of Commerce Station (KCX) for weather and field conditions.

There is no restaurant at the field, the nearest one being approximately two miles. There are three good hotels and three good theatres in the city, all of which have very reasonable rates.

Several pilots have expressed surprise at finding a detachment of the Air Corps on duty at this Airport, and the News Letter Correspondent states: "It is believed if the information herein is distributed generally thru the medium of the Air Corps News Letter more personnel will take advantage of the excellent accommodations and facilities at this field. It might be well to stress the fact, too, that this is a regular stop for United Air Lines and the runways (one approximately 3800' x 150' and one 2800' x 100') are always in excellent condition."

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"Early Bird," From page 7.

half minutes before he could free himself. He had a passenger with him on both occasions. In the latter accident a control cable became lodged between the back of his neck and the upper extension of his life preserver. It took the last bit of Horton's strength to pry the cable loose.

Horton, who remembers many other thrills and tragedies of the "Early Birds," has been a civil service employee since 1917, and has been at Duncan Field for the past 19 years.

"The greatest change in airplane design from 1914 to the present," he said, "is that in early models no instruments or flight indicators, engine gauges and other such things were used. They had 90 horsepower engines with top speed of 55 miles per hour, whereas modern planes have 1,800 to 3,600 horsepower, 40 or more instruments, and fly from 300 to 400 miles per hour."

- San Antonio NEWS.

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Commendation for Pvt. Hewgley (Fr. P.6.)

death of two Coast Guard officers, a Coast Guard petty officer and an Army non-commissioned officer.

The assistance rendered by Private first class Bill Hewgley, U.S. Army, is very much appreciated, and it is requested that record be made of same."

V-7946, A.C.

## WE THINK SO, TOO!

The Kelly Field Correspondent submitted the following article, which appeared in the San Antonio Evening News of December 30, 1938, and which he believes should be of interest to Army Air Corps personnel who formerly served at Kelly Field:

"Zooming over the Airdromes
By T.D. Higgins
'Veteran'

An interesting character out Kelly Field way is Mrs. W.E. Rowe, who has operated a little cafe just off the airdrome for the past 21 years, during which time she has seen thousands of Uncle Sam's soldiers and student pilots come and go.

Mrs. Rowe has operated her cafe in a modest two-room frame building since 1917, the same year that construction was started at the present Kelly Field No. 2. She was there even before the soldiers arrived.

Mrs. Rowe is very proud of the 'boys' who have called Kelly Field their home during the past two decades.

'There have never been any better boys at any post in the country than those who have served here through the years,' she will tell you with conviction. She has seen many of them retired from the Army at Kelly Field, she has seen others leave never to return, and she has welcomed others back after they had been transferred to other posts.

Just the other day a soldier who was a private at Kelly Field when he was transferred away 14 years ago, paid her a visit as one of his first acts in returning to the airdrome. And he came back as a first sergeant.

The enlarged classes at Kelly Field, which necessitates more flying, doesn't bother Mrs. Rowe in the least. She said there was lots more flying during the World War. The noise of the airplane motors then was so great one had to shout to carry on a conversation in the cafe.

Mrs. Rowe receives cards from the 'boys' from many distant points. This Christmas she heard from some in Panama and Hawaii. They never forget her. And while they come and go with the years, Mrs. Rowe remains in her little cafe - in the same building she has occupied the past 21 years."

We think so, too, Mrs. Rowe!

---oOo---

The 74th Attack Squadron, Albrook Field, Panama Canal Zone, is planning a mass flight to Guatemala City late in the month of January, and preparations are being made for a flight to the States. The date of departure of the Albrook Field pilots on this flight has not yet been announced.

## REFRESHER RESERVE OFFICERS LEAVE FOR NEW STATIONS.

The following-named second lieutenants of the Air Reserve, who satisfactorily completed the refresher course of instruction for Air Corps Reserve officers at the Air Corps Advanced Flying School on December 23, 1938, departed from Kelly Field on January 4, 1939, for their new stations:

William C. Armstrong and James O. Beckwith, Jr., to Selfridge Field, Mich.

Lawrence R. Gibboney, Walter L. Hawkins, Robert J. Koster and Eugene McCurdy to Barksdale Field, La.

William W. Holmes to Brooks Field, Texas.

Charles J. Langmack to March Field, Calif.

Frederick H. Postal to Langley Field, Va.

Second Lieuts. Joseph C. Mackey and Claud A. O'Quinn were assigned to the Advanced Flying School, Kelly Field, for duty as flying instructors, the former with the Pursuit Section and the latter with the Attack Section.

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## RADIO MEN GRADUATE FROM TECHNICAL SCHOOL

Twenty six Air Corps enlisted men were graduated from the Radio Repairers and Operators class of the Air Corps Technical School, Chanute Field, Rantoul, Ill., on December 16, 1938.

These graduates were sent to the following stations:

Scott Field, Belleville, Ill., 1;
Kelly Field, San Antonio, Texas, 2;
Selfridge Field, Mt. Clemens, Mich., 4;
Barksdale Field, Shreveport, La., 4;
Fort Sam Houston, Texas, 1;
Langley Field, Hampton, Va., 4;
Hamilton Field, San Rafael, Calif., 4;
Fort Leavenworth, Kansas, 1;
March Field, Riverside, Calif., 1;
Mitchel Field, Long Island, N.Y., 3;
Chanute Field, Rantoul, Ill., 1.

Since October 7, 1938, there have been 174 men graduated from various courses taught at the Air Corps Technical School. The number of graduates and the courses from which they graduated are as follows:

Radio Repairers and operators, 45;
Airplane mechanics, 58;
Aircraft machinists, 6;
Aircraft welders and sheet metal workers, 12;
Instrument specialists, 13;
Propeller specialists, 13;
Carburetor specialists, 11;
Electrical specialists, 12;
Parachute riggers, 4.

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OF ALMA MATER.

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"Although these figures do not compare in volume with some of the stations in the east and north, they indicate that the 'West Point of the Air' has assumed the role of Alma Mater to an increasing number of graduates, who are beginning to look on the Training Center as more than another school in the United States Army system, for it was at the Primary Flying School that their future careers were moulded," the Air Corps News Letter Correspondent declares.

During the last 15 days of December, pilots and crews from 21 fields in a total of 49 airplanes dropped in at Randolph Field, either for service or for an overnight stop. Among the fields which furnished visitors during this period were:

Adams Field, Little Rock, Ark.
Anacostia, D.C.
Barksdale Field, La.
Bolling Field, D.C.
Chanute Field, Ill.
Hamilton Field, Calif.
Hartford, Conn.
Hensley Field, Texas.
Langley Field, Va.
Maxwell Field, Ala.
March Field, Calif.
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Newark, N.J.
Moffett Field, Calif.
Mitchel Field, N.Y.
Lambert Field, Mo.
Lowry Field, Denver, Colo.
Quantico, Va.
Pensacola, Fla.
Wright Field, Ohio.

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LOW FLYING TO READ SIGN POSTS

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Finally, one afternoon, a young lady of San Antonio asked her escort as they passed through the gate, just what was the meaning of all these mysterious road signs. He was experienced in the art of answering questions of a technical nature, and for fear of becoming involved should he attempt to describe the intricate workings of the Instrument Landing System, he merely passed the question off with: "Oh, they're just used in connection with Instrument Landings."

Puzzled for a moment over this answer, the young lady then brightened up and said: "Well, I guess the poor pilots have to fly awfully low to be able to read those little signs."

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NEW DAY ROOM DEDICATED AT MITCHEL FIELD

The 2nd Air Base Squadron at Mitchel Field, L.I., New York, dedicated its new Day Room on December 22, 1938. Colonel T.J. Hanley, Base Executive Officer, and Major James W. Hammond, Commanding Officer of the 2nd Air Base Squadron, were among those present during the festivities. First Sergeant Russell Highley delivered an address, during the course of which he presented the Day Room to the members of the organization. Refreshments were served and all members present enjoyed themselves.

The new Day Room is located in the basement of "A" Barracks and comprises approximately 3000 square feet of floor space. It is equipped with the most ultra-modern chrome trimmed upholstered furniture and indirect lighting fixtures. A fire place, floor lamps, card tables and magazines make this one of the "homiest" day rooms to be found throughout the Army.

Members of the 2nd Air Base Squadron extend their invitation to visiting enlisted personnel to spend their spare time taking advantage of this comfortable Day Room.

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Upon the completion of their tour of duty in the Panama Canal Department, 2nd Lieuts. Harry L. Donicht and Ladson G. Eskridge, Jr., are to proceed to the Air Corps Technical School for duty, the first-named at the Denver Branch at Lowry Field, Colo., and the last-named at Chanute Field, Rantoul, Ill.


V-7946, A.C.

## WARRANT OFFICER ADOPTED BY INDIAN TRIBE

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Following completion of the initial ceremonies, two very hospitable chiefs of the tribe - "Looking for White Porcupine Quills" and "Displayed on the Sacred Altar - invited "Fox Claws" to visit the Hopi Tribe in its native Arizona.

"Make us a visit," they urged. "Come and see us and stay for a year."

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"The Provost Marshal's office reports that 1,018 automobiles are registered on the post, but this number does not include the cars operated by the temporarily employed civilians. In addition to the automobiles permanently registered, there is a steady flow of visitors to the 'West Point of the Air,' but despite the 'down town' traffic congestion that occasionally arises, only four minor traffic accidents have been reported in the year 1938."

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V-7946, A.C.

## RETIREMENT OF TECHNICAL SERGEANT MOORE

Orders were recently received from the War Department placing Technical Sergeant John Henry Moore, 46 years of age, of Kelly Field, Texas, on the retired list of the Army, effective December 31, 1938, after more than 30 years' active service.

Sergeant Moore, who was a member of the Medical Department (Veterinary Service), first enlisted in the Regular Army on October 19, 1909, at Columbus Barracks, Ohio, during which enlistment he served with the 15th U.S. Infantry ("Can Do" Regiment) in the Philippine Islands and in China. During subsequent enlistments he served with the 20th, 8th and 31st regiments of Infantry, both in the States as well as in the Philippines and in Siberia, and in the Medical Department at a number of military posts.

During the World War, Sergeant Moore served with the American Expeditionary Forces in Siberia. He recalls that his service in that far-flung outpost of Uncle Sam was probably the most unpleasant in his career, due to the extremes in temperature. At Vladivostok, where he was stationed, the thermometer registered 110 degrees in the shade (AND NO SHADE) in the summer of 1919, and during the winter of 1918-19 it registered 63 degrees below zero - where for three days and nights the men of his organization were unable to leave their billets due to the severe cold, and of necessity wore practically all their clothing and bedding to keep from freezing. The most pleasant moment of his service in Vladivostok, according to the Sergeant, was the day he led the Armistice Day Parade in that city - which was participated in by all troops of the Allied Armies - when he was Drum Major of the 31st U.S. Infantry Band.

While in the Philippines, Sergeant Moore took personal care of Major General Omar Bundy's favorite mount, and upon receiving his discharge from his then current enlistment was given the very unusual distinction of having his discharge certificate signed personally by General Bundy.

In reminiscing over his happy 30 years of interesting and varied active service, Sergeant Moore looks back to the most pleasant service he enjoyed while serving two tours of duty with the 15th and 20th regiments of Infantry at Fort Douglas, Utah. He reiterated, however, that his more than nine years' service in the Philippines, China and Siberia were probably the most interesting and diversified.

This splendid noncommissioned officer, who has served his country in the far corners of the earth, somehow or other managed to serve at intermittent periods in the San Antonio area for about 10 years. Sergeant Moore owns a home on Monterrey Street in San Antonio, where he and his wife intend to live part of the time. He also owns a small farm at Cotulla, and he expects to divide his time between these two places, as he has a number of relatives living in both localities.

Sergeant Moore, who is retiring at an unusually young age, entered the service at the age of 17. He benefitted considerably through the double time credit he received for foreign service. He was born and raised at Friendly, West Va. He recalls that after leaving his Friendly home he proceeded to Kentucky to win fame and fortune. He found work there, but states that it did not come up to his expectations, and looking to other fields he decided that the Army was the place for him. He thereupon enlisted, and he has served his flag continuously ever since.

The Sergeant received the grade of Technical Sergeant on December 2,1938, and is the proud possessor of the World War Victory Medal with Siberia clasp.

During his earlier days in the service (1913-1915), he recalls with pride that he was a member of a detachment at Fort Bliss that escorted General Macado of the Mexican Army and his army of 5,000 men from Marfa, where the General had surrendered to a detachment of the 15th Cavalry, to Fort Bliss, and then to Wingate, New Mexico, for confinement at a detention camp. According to the Sergeant, when the initial muster was made of the Mexican prisoners, some 5,200 were counted, but after about a week, when the word went the rounds of how well the American Army fed its prisoners, an additional thousand prisoners managed somehow or other to "crash" the stockade of the prison.

All of Sergeant Moore's discharge certificates bear the notation of "Character - Excellent," and he has been the recipient of numerous commendations for his meritorious service, the latest being the one received last August from the Quartermaster Supply Officer, 8th Corps Area General Depot, for the efficient manner in which he performed his duties as assistant to the Veterinarian of that Depot during the conduct of the Third Army Maneuvers.

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## TEMPORARY PROMOTIONS

Special Orders of the War Department, recently issued, announced the temporary appointment as of January 1, 1939, of Lieut. Colonel John B. Brooks, Air Corps, to the rank of Colonel; Major Joseph H. Davidson, Air Corps, to the rank of Lieut. Colonel, and Captain Everett S. Davis, Air Corps, to the rank of Major.

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## COL. MYERS TRANSFERRED TO HAMILTON FIELD

Special Orders of the War Department, recently issued, relieved Lieut. Colonel David A. Myers, Medical Corps, Flight Surgeon, from duty in the Office of the Chief of the Air Corps, Washington, D.C., and assigned him to station at Hamilton Field, San Rafael, Calif. Colonel Myers, who has been on duty in the Medical Section, Office of the Chief of the Air Corps, since February 20, 1935, became Chief of that Section on October 17, 1938, upon the relief from duty as Chief Flight Surgeon of his predecessor, Lieut. Colonel Malcolm C. Grow, Medical Corps.

A native of Cambria, Wis., where he was born on June 16, 1876, Colonel Myers graduated from high school at Marshfield, Wis. He then attended the University of Minnesota for two years, and in the year 1898 he graduated from McGill University, Montreal, Canada, with an M.D.C.M. degree.

During the World War, Colonel Myers, on October 19, 1918, was appointed a Captain in the Medical Corps, U.S. Army. For several weeks he was on duty as an Instructor at the Medical Officers' Training Camp at Camp Greenleaf, Fort Oglethorpe, Ga., following which he was transferred to Payne Field, West Point, Miss., where for a period of about six months he was on duty as Assistant Post Surgeon and later as Post Surgeon.

After a period of duty as a student officer at the Medical Research Laboratory at Hazelhurst Field, L.I., New York, which was then the School for Flight Surgeons, and following his graduation therefrom, he was, on July 25, 1919, transferred to Post Field, Fort Sill, Okla., for duty as Flight Surgeon. On October 18, 1919, he was transferred to Kelly Field, Texas, for duty as Flight Surgeon in connection with the Mexican Border patrol. In April, 1922, he was assigned to duty as Flight Surgeon with the 12th Observation Squadron at Fort Bliss, Texas.

For nearly three years, from April, 1923, Colonel Myers was on duty in the Hawaiian Department as Senior Flight Surgeon, with station at Luke Field. Upon his return to the United States in May, 1926, he was assigned to duty at Crissy Field, Presidio of San Francisco, Calif., as Post Surgeon. Four years later, he was transferred to Mitchel Field, L.I., New York, where he served until April, 1933, when he was assigned to station at Fort Screven, Ga., where he served as Post Surgeon, also as District Surgeon, C.C.C., for the States of Florida, Georgia and South Carolina, until his assignment to duty in Washington in February, 1935.

It was during the year 1926, when Col. Myers was stationed at Crissy Field, Calif., that he and Lieut. Colonel Wm. C. Ocker, Air Corps, conducted certain experiments and research work which led to the introduction of instrument flying instruction in the Air Corps. It had been firmly established that individuals who were blind-folded, placed in a revolving chair and rotated for a few turns, invariably replied after the chair was gently stopped that they had started to turn in the opposite direction of prior motion. The tendency of an individual's senses to play him false in a situation of this kind is the result of induced vertigo.

Colonel Myers gave this induced vertigo test to Colonel Ocker to ascertain what the mental reactions of an old-time pilot would be when he discovered he could not tell whether he was turning or sitting still. Following the test, Colonel Ocker departed without comment of any kind, but soon returned with a view box which he carried in his hand. Colonel Ocker had realized the fallibility of the human senses as a true barometer of the actions of an airplane in flight, when the vision of the pilot was cut off by fog or other conditions. He and Colonel Myers designed a small box with a bank and turn indicator and other instruments which was intended to be used in connection with the testing of pilots in the revolving chair, in order to demonstrate the fallibility of the human senses when contact with the earth by means of sight was no longer possible.

With the view box in his possession, Colonel Ocker was again examined by Colonel Myers. The revolving chair test was repeated in all combinations of rotation, using the unlighted box to cut out the light and thus remove sight from the equilibrium senses. There was the usual induced vertigo, with the usual inability to tell correctly which way the body was turning. One of the instruments, a gyroscope, was then started, and the Bank and Turn Indicator was put into action. A flashlight bulb installed in the view box was turned on and the tests were repeated. This time every answer was correct as to direction of motion, stopping and starting. Even the confusion of reversals was absent. The sensations were felt the same as before, but by giving the answer shown by the indicator needle on the Bank and Turn instrument instead of the answer prompted by his senses, it was found impossible to confuse him.

This demonstration started the research into blind flying. It was immediately recognized that here was the answer to the inability of pilots to perform blind flying without a visual reference to gravity. By lighting the box, the equilibrium senses were restored to a coordinated action. Merely restoring sight to the equilibrium sense is not enough, however. There must be something within the pilot's range of vision that will act as a ver-

tigo stopper and tell him what position his ship is in with relation to the earth's surface; in other words, allow the pilot mentally to visualize "where is the ground," and to establish his spatial position. The needle on the Bank and Turn Indicator will accurately show motion in either direction, right or left, and will come to a dead center and remain there when there is no rotation.

Constant repetitions of demonstrations with the Ocker-Myers "Vertigo Stopper Box" finally convinced pilots that it was a real lie detector and that, on the ground at least, they could not tell which way they were turning, provided there was no visual reference on which the sense of sight could depend.

With Colonel Ocker at the controls, Colonel Myers spent many hours in the air as a "Blind Flying" observer in a hooded cockpit in which no instruments had been installed. By means of strings he communicated to Colonel Ocker what he (Colonel Myers) thought Colonel Ocker was doing with the ship from time to time. Colonel Ocker kept notes of the various maneuvers the airplane was put through, and upon returning from these flights the observations of Colonel Myers on the actual performance of the plane were checked. Invariably Colonel Myers was unable to tell with accuracy what maneuvers the plane had gone through or in what position the plane was at a certain specified time.

The value of the Ocker-Myers view box became generally recognized as the only means available of instructing pilots and prospective pilots while on the ground in the sensations they would experience and the reactions they would have if they attempted to do blind flying without an artificial horizon. The definition given for "Artificial Horizon" is set forth in the original manuscript reporting on this research work, and is as follows:

"Any instrument or combination of instruments which will quickly, easily and reliably give the pilot information which he may mentally visualize in terms of where is the ground."

Alluding to Colonel Myers as the silent partner of Colonel Ocker in working out the faulty reactions of pilots and the necessity of learning to fly by instruments, a high-ranking Air Corps officer made the statement that if it had not been for Colonel Myers' work it is doubtful whether much progress would have been made in this connection.

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Colonel Myers is the author of many articles which have been published in medical journals. Following his graduation from McGill University, he was engaged for several years in post graduate work in medicine at St. Louis, Chicago and Cleveland. He was house surgeon both at St. Mary's Hospital at Oshkosh, Wis., and St. Agnes Hospital at Fond du Lac, Wis.; Surgeon at the Southwestern Hospital, Lawton, Okla., and Consulting Surgeon at the Kiowa Commanche Indian Hospital, also at Lawton, Okla. He was also Surgeon with the Southwestern Bell Telephone Company and with the Southwestern Electric Company. For a period of eight years he was Assistant State Health Officer for Oklahoma, and other civic positions he filled were those of City Physician of Lawton, Oklahoma, and County Physician, Commanche County, Oklahoma.

Colonel Myers is a member of the American Medical Association and a Fellow of the American College of Surgeons. He served as assistant professor, Medical Jurisprudence, Oklahoma University; also as president of the Oklahoma State Medical Association; president and vice-president of the Commanche County Medical Association, and vice-president of the Southwestern Medical Association.

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## A NEW CRASH BOAT REACHES ALBROOK FIELD

A new crash boat, designated as the P-18, was delivered to the Transportation Officer at Albrook Field, Panama Canal Zone, late in December, having been shipped from the States aboard the Army Freighter LUDINGTON. The new rescue boat is a 35-foot cruiser, built in Freeport, Long Island, N.Y., and is capable of speeds up to thirty miles per hour.

A larger boat, which is being rebuilt from a Navy hull, will, when completed, be turned over to the A & R Department at Albrook Field and placed at the disposal of post personnel for recreation purposes.

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## AN ERRAND OF MERCY IN THE CANAL ZONE

On the afternoon of December 28th, at the request of the Commanding Officer of the Fleet Air Base at Coco Solo, Canal Zone, an aerial search was initiated for a Naval officer, Captain Sherman, who was overdue at Coco Solo, enroute from David, Republic of Panama. Before the search planes had taken the air, a report came in by telephone of the forced landing of the ship, type F4B4, from the town of La Mesa, where there is an auxiliary landing field on the David route. Two A-17's, flown by Lieuts. Clark and Gent, were sent to the field, with Lieut. Colonel Wood S. Woolford, Medical Corps, to care for the injured pilot and return him to his station.

The plane had been crashed in a forced landing and the pilot, suffering from a broken leg and broken ribs, had been brought in on horseback from the

## PURCHASE DATE OF FIRST ARMY AIRPLANE

A reader of the Air Corps News Letter, Colonel Charles deF. Chandler, who was affiliated with Army aviation in its early days from the very beginning, and who is now on the retired list, takes exception to the statement in the New Year greeting of the Chief of the Air Corps in the January 1st issue to the effect that July 29th is the anniversary date of the purchase of the first Army airplane. He states that that date is a bit too soon according to the official records, adding that the demonstration of the cross-country feature and speed test for the Wright airplane by Orville Wright was not conducted as part of the official trials at Fort Myer, Va., until July 30th, one day after the date referred to in the greeting as the purchase date. He adds further that after all of the tests had been completed, the Aeronautical Board held a formal meeting on August 2, 1909, which proceedings recommended the acceptance of the Wright machine. The proceedings of the Aeronautical Board were approved by the Chief Signal Officer on the same date.

Colonel Chandler contends that because of that action on the second of August, it would seem that date is the proper one to use as the beginning of Army Aviation.

The News Letter expresses its appreciation to Colonel Chandler for bringing its attention to this matter and gladly accepts the correction.

Colonel Chandler was Commanding Officer of the first Army Aviation Schools at College Park, Md., and Augusta, Ga., during the years 1911 to 1913. He was a member of the Board of Officers conducting the Wright airplane trials at Fort Myer, Va., in 1909. During the World War he served overseas as Chief of the Balloon Section, A.E.F., from November, 1917, to February, 1918, and was then ordered to Washington for duty as Chief of the Balloon and Airship Division.

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## Trends in Military Aircraft and Accessories

(Continued from Page 5.).

ponents will probably change but little, as they are molded by inflexible laws governing the contours, designed to pass readily through a fluid medium. But in general arrangement, several recent developments - or more properly speaking, revival of old ideas - have begun to exert quite a large and disturbing influence. The first is the reincarnation of the nose wheel, the same in principle as the one used in 1908. The second revival is still some distance off, but it is yet a more radical change; that is, the 'tail-first arrangement.' This consists in locating the horizontal tail surfaces ahead of the wing and thus utilizing all of the tail surfaces in a lifting effort. It goes without saying that we must improve our aerodynamic cleanness of design and this entails smooth contours, low drag power units, thin wings, completely retractable landing gear, no interference, the absolute minimum of cooling drag, and the general absence of all bumps such as exposed rivets, lap joints, tail wheels, exhaust stacks, air intakes, aerials, and a host of other parasites. A smooth finish is requisite to reduced skin friction drag and all openings must be carefully sealed to prevent leaks and subsequent interference losses. Crew accommodations and arrangement must be reduced to the minimum dimensions consistent with efficient fulfillment of the military mission."

With respect to aircraft engines, General Arnold stated that no matter how aerodynamically clean aircraft may become in the near future, cruising speeds of 300 m.p.h. and above for bombardment aircraft, and high speeds of between 450 and 500 m.p.h. for pursuit planes will mean great increase of horsepower with a considerable stepup in the unit size of engines. Motors of from 3-4,000 h.p. no doubt will be built and engines of larger size will be constructed if these prove satisfactory. He added that "since in all probability we have already attained the maximum size in the individual cylinder, the problem becomes one of grouping a multiple number of cylinders in an arrangement that creates the minimum amount of aerodynamic drag. As airplanes grow larger we undoubtedly shall bury the engines completely within the wing. Mechanical layout, cooling, balance, firing order distribution, and supervising should all be thoroughly analyzed with a view to great improvement.

"Engine development and fuel development have progressed hand in hand. The improvement in anti-knock value of fuels has been largely utilized by present aircraft engines in obtaining increased power output. In this connection the engine of today burns its own weight of fuel in a four-hour flight at cruising speed. For long range airplanes one can readily see where low specific fuel consumption will become more important than specific weight of engine.

"The long range airplane will be of little value unless its power plants are able to function for long periods of time under minimum fuel consumption conditions. Such engines must be designed for extreme reliability and durability far in excess of anything available today. It is quite probable that both the aircraft structure and the propeller will have to be insulated against the abnormally severe vibrations that breed in the engine.

"It appears to me that engine development at the present time is lagging

behind many other aeronautical features and accessories and that there must be early stimulation of engine development to provide us the airplanes we require."

Pointing to the possibility of the aluminum industry being seriously handicapped in supplying all the needs of the aircraft industry in the event of a major emergency, General Arnold stated that the Air Corps is now investigating the manufacture of airplanes made of materials other than aluminum; that bakelite propellers and pulleys have been known for years and instrument boards and cases are now being satisfactorily molded. There is the possibility of molding wing spars and ribs and fuselages from thermo-setting plastics reinforced by wood and wire. "The industry," he said, "can be expected to investigate this possibility fully in the very near future, with what may perhaps be startling results.

"We are today flying a small quantity of spot-welded stainless steel wings and predict that the use of spot-welded stainless steel is on the up grade. More of it will be used, particularly around the engine nacelles to reduce the fire hazard. Perhaps we shall make a complete airplane out of stainless steel eventually.

"The spot welding of aluminum alloys is also on the increase, and may within a few years take the place of flush rivets on exposed surfaces. The Air Corps has one pair of aluminum wings flying today which are entirely spot-welded."

Declaring that the modern airplane requires materials having a high strength-to-weight ratio, General Arnold added that other factors, such as fatigue strength, yield strength, notch sensitivity, ductility, impact strength and corrosion resistance, are of importance and must be considered in designing airplane parts.

"At the present time," he said, "aluminum alloys constitute between 75 and 85 percent of the structural weight of many military airplanes and approximately 50 percent of the weight of the engine. There is room for improvement in the ability of these alloys to resist fatigue. Forging alloys of aluminum have a fatigue strength of only 25 percent of their ultimate, whereas in the forging alloys of steel the fatigue strength approaches 50 percent of the ultimate. Perhaps some brilliant metallurgist in the near future can rearrange the grain structure, or perfect a forging technique to develop further this very important physical property.

"Recent developments of an alloy of magnesium-aluminum-zinc and manganese have improved the resistance to corrosion. It appears that other metallurgical improvements may extend the application of magnesium in aircraft construction.

"The heat-treated low-alloy steels are standard materials for highly stressed airplane and engine parts. The use of SAE-4140 and 4340 steel is increasing because of their good forging properties and their ability to develop high and uniform properties in relatively heavy sections after oil quenching. There is need for a steel which will have a tensile strength of 250,000 to 300,000 pounds per square inch, together with a reasonable ductility, impact strength and a fatigue strength of half its ultimate. Such a steel has not yet appeared.

"The development of austenitic steels and the nickel-chromium-iron alloys, as well as the nickel-molybdenum-iron alloys, will probably continue in an effort to get a more suitable material for exhaust stacks. We are looking for something which will resist corrosion and scaling and yet have a high strength at elevated temperatures.

"The use of paint-type coatings on the exterior surfaces of metal covered airplanes will probably decrease. It is doubtful if the weight added by paint finishes, their cost of application and maintenance, especially with the difficulty of maintaining the coatings on leading edges of high speed airplanes and the cost of removal and refinishing after a period of service warrants the return to painted surfaces on future aircraft.

"The replacement of rubber material, which is a strategic material, with rubber-like synthetics is being rapidly accomplished. Synthetic hose for fuel, oil and prestone lines has proved superior to the rubber hose, and the use of synthetics is rapidly extending to tires, tubes and balloon fabrics.

"We expect in the near future to fabricate our parachutes out of man-made material which promises in every respect to exceed the performance and properties of the fiber made by the silkworm. We are doing everything possible to utilize materials made in America. Research and development will continue with the objective of making ourselves self-sufficient so that we will not have to rely upon a foreign source of supply for an essential raw material in a time of national emergency."

Pointing to the prospective increase in horsepower, together with the planned increase in high altitude flying as requiring a considerable acceleration in propeller development, General Arnold stated that the solution of propellers for the smaller airplanes will probably be found in the design of propellers having four and finally six blades of relatively small diameter, mounted either in a single hub or divided equally between two hubs which revolve in opposite directions about the same center of rotation. For the larger airplanes the solution will be found in the development of propellers of three, or possibly four, blades having a diameter upward of 20 feet. The primary design problem here necessitates the satisfactory development of

blades much lighter in weight than present types while still maintaining satisfactory blade efficiency, endurance and perfect safety. Hollow steel, hollow dural, magnesium, and plastically impregnated wood all seem to be possibilities.

Because of the high efficiency and flexibility of operation of the controllable propeller as it exists today, it will be many years before any other means of propulsion, such as rocket or jet propulsion, can be expected on a large scale.

Referring to the first completely automatic landing to be made anywhere in the world as having been accomplished at Wright Field in August, 1937, and to the fact that many have been made since then, General Arnold stated that although the present equipment has not reached that stage of development that enables us to use it on production airplanes, we hope to service test a small quantity before long. "Our engineers who developed the automatic landing device," he said, "were awarded the Mackay Trophy last September for the outstanding military flight of the year. When completely developed, this apparatus presages the time when conditions of zero visibility will be no limiting factor to the operation of the airplane, either civil or military."

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## EXPANSION OF AIR MAIL OUT OF LOS ANGELES

According to statistics compiled by the Los Angeles, Calif., Chamber of Commerce, air mail originating in that city has shown a steady growth year after year. Based on official records, the figures reveal that beginning in 1933, during the era of the spacious trimotored airplanes, the total poundage originating at the Los Angeles post office during that year was 494,661. By the end of 1934, the poundage had grown to 501,168 for that period. For the year 1935, the air mail increased to 910,255 pounds; for 1936 to 1,230,730 pounds; for 1937 to 1,468,579 pounds, and for 1938 to 1,556,772 pounds. Thus, the air mail poundage in 1938 was three and one-fifth times that of 1933.

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## RUNWAYS AT ALBROOK FIELD

Construction work on the proposed runways at Albrook Field, Panama Canal Zone, commenced on the morning of December 20th last. It is reported that only one-third of the landing area of Albrook Field is being used at the present time, the remainder being marked off with flags.

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## REBUTTAL
(Anonymous)

Last night
deep in the pages of a slick
papered publication which I buy
each month to look at the pictures
I chanced upon the discreet and
dignified advertisement
of a dignified insurance firm
for his text
tho adwriter
had chosen the calm efficiency
of modern flying
and mentioning no exceptions
declared that olden days of
glory and adventure
have passed away in this great
industry
and that calm precision is the
byword of the air
with pilots raising kids and chickens
instead of hell
becoming pillars of their communities
as it were
the message was put across
in fine style and quite
convincingly
but none the less
was somewhat erroneous
for there is no little of
the old harry
in everyone who has shaken hands
with a stick
and I wondered if that adwriter would get
canned
if some joe forgot his manners
momentarily
and snap rolled a douglas
full of debutantes and other
important people
no douht there would be
a stink
the thought is far fetched
yet amusing
and it serves my point
for I'm certain mister adwriter
would qualify his
statement
with a little asterisk denoting
certain air corps activities
were he privileged to see a p twenty six
being properly maltreated
in aerobatic maneuvers
for there can be no calm
precision
when you're tail up in a loose
belt and hanging onto a
throttle quadrant
wondering
behind which cloud the ground
is hiding.

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# U.S. ARMY AIR CORPS GENERAL OFFICERS

HENRY H. ARNOLD
MAJOR GENERAL
CHIEF OF THE AIR CORPS

AUGUSTINE W. ROBINS
BRIGADIER GENERAL
CHIEF MATERIEL DIVISION

WALTER G. KILNER
BRIGADIER GENERAL
ASST. CHIEF OF THE AIR CORPS

BARTON K. YOUNT
BRIGADIER GENERAL
AIR CORPS TRAINING CENTER

# G.H.Q. AIR FORCE

FRANK M. ANDREWS
MAJOR GENERAL
COMMANDING GHQ AIR FORCE

HAWAII

WALTER H. FRANK
BRIGADIER GENERAL
COMDG 18TH COMPOSITE WING

DELOS C. EMMONS
BRIGADIER GENERAL
COMMANDING 1ST WING

ARNOLD N. KROGSTAD
BRIGADIER GENERAL
COMMANDING 2ND WING

FREDERICK L. MARTIN
BRIGADIER GENERAL
COMMANDING 3RD WING

PANAMA

HERBERT A. DARGUE
BRIGADIER GENERAL
COMDG 19TH COMPOSITE WING